

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MAREK TORBUS
and
GERAD LADEGOURDIE

Appeal No. 2002-2063
Application No. 09/635,093

HEARD: JULY 16, 2003

Before OWENS, PAWLIKOWSKI, and MOORE, *Administrative Patent Judges*.

MOORE, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 12-29. Claims 1-11 have been canceled. Thus, only claims 12-29 are before us on this appeal.

REPRESENTATIVE CLAIM

Claim 12 is representative of the claims on appeal and reads as follows:

12. A two-component polyurethane based binder system for casting molding materials, said binder system consisting essentially of:

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(a) a phenolic resin component consisting essentially of at least (i) one phenolic resin exhibiting free phenolic and free alcoholic OH-groups and (ii) a solvent for the phenolic resin; and

(b) a polyisocyanate component consisting essentially of (i) at least one polyisocyanate capable of reacting with said phenolic resin exhibiting free phenolic and free alcoholic OH-groups to form a resin therewith and (ii) a solvent for said polyisocyanate;

wherein said solvent (b) (ii) for said polyisocyanate is comprised at least in part of a fatty acid methyl ester, wherein said fatty acid methyl ester is a methyl monoester of one or more fatty acids with a carbon chain of twelve or more carbon atoms, and wherein said solvent (b) (ii) for said polyisocyanate contains more fatty acid methyl ester than high-boiling aromatic hydrocarbon.

The Reference

In rejecting the claims under 35 U.S.C. § 103(a), the examiner relies upon the following reference:

Furness et al. (Furness) 3,904,559 Sep. 09, 1975

The Rejection

Claims 12-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Furness.

The Invention

The invention relates to a two-component polyurethane-based binder system which consists essentially of a phenolic resin and a solvent for the phenolic resin, a polyisocyanate and a solvent for the polyisocyanate which contains more fatty acid methyl esters (FAME) than high-boiling aromatic hydrocarbons. (Appeal Brief, page 1, line 13 - page 4, line 19).

The Rejection of Claims 12-29 Under 35 U.S.C. § 103 (a)

The examiner has found that Furness teaches compositions including a phenolic resin having phenolic OH groups and alcoholic OH groups, polyisocyanate, solvent, and FAME. (Examiner's Answer, page 2, lines 23-25). The examiner has further found that Furness discloses 5-8% methyl ester of stearic acid. (Examiner's Answer, page 3, lines 4-8). The examiner then concludes that it would have been obvious to formulate compositions including the phenolic resin having phenolic OH groups and alcohol OH groups, isocyanate, solvent, and methyl ester of stearic acid as such compositions are suggested by Furness (Id., lines 14-22).

The appellants raise numerous issues in their comprehensive 39 page brief on appeal. The issues can be categorized, for ease of discussion, into three areas - (1) claim interpretation, (2) reference interpretation, and (3) secondary considerations. Both the examiner and the appellants make conflicting and erroneous statements of fact and law, which requires us to start anew lest we get lost in the welter of disjointed arguments that prosecution of this application has become.

Claim Interpretation

We need consider the scope and meaning of certain terms that appear in appealed claim 12. See Gechter v. Davidson, 116 F.3d 1454, 1457, 1460 n.3, 43 USPQ2d 1030, 1032, 1035 n.3 (Fed. Cir.

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1997); In re Paulsen, 30 F.3d 1475, 1479, 31 USPQ2d 1671, 1674
(Fed. Cir. 1994).

We begin with the preamble. Generally, the preamble does not limit the claims. DeGeorge v. Bernier, 768 F.2d 1318, 1322 n.3, 226 USPQ 758, 764 n.3 (Fed. Cir. 1985). However, the preamble may be limiting "when the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention." Bell Communications Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620, 34 USPQ2d 1816, 1820 (Fed. Cir. 1995). If the preamble is "necessary to give life, meaning and vitality" to the claim, then the claim preamble should be construed as limiting. Kropa v. Robie, 187 F.2d 150, 152, 88 USPQ 478, 480-81 (CCPA 1951). This is determined "on the facts of each case in view of the claimed invention as a whole." In re Stencel, 828 F.2d 751, 754, 4 USPQ2d 1071, 1073 (Fed. Cir. 1987); see also Applied Materials, Inc. v. Advanced Semiconductor Materials Am., Inc., 98 F.3d 1563, 1572-73, 40 USPQ2d 1481, 1488 (Fed. Cir. 1996) ("Whether a preamble stating the purpose and context of the invention constitutes a limitation . . . is determined on the facts of each case in light of the overall form of the claim, and the invention as described in the specification and illuminated in the prosecution history.").

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The examiner, throughout the final rejection and Examiner's Answer, deems the preamble to be non-limiting.

On the other hand, the appellants have urged that the preamble be construed as limiting the claimed invention to a two-component binder system (Appeal Brief, page 6, lines 13-14; page 10, line 15 - page 12, line 6).

We find that the two-component system is described component by component (designated (a) and (b)) with certain properties which are required of and consistent with the reaction of a polyurethane based binder system. Further, the specification has defined a two component system in the specification at page 1, lines 3-9, as containing one component which consists of polyols with a minimum of two OH groups in the molecule and polyisocyanates with a minimum of two NCO groups in the molecule. Polyols are said to be formed by condensing phenol or phenol compounds with aldehydes which contain free OH groups (Specification, page 1, lines 10-12).

Accordingly, we agree with the appellants and determine that based upon the instant facts that the preamble of claim 12 is entitled to some weight, as the claimed composition must contain at least one polyol with a minimum of 2 OH groups, at least one polyisocyanate, and be capable of acting as a two-component polyurethane-based binder system.

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We next turn to the transitional phrase "consisting essentially of." The term "consisting essentially of" is open to unrecited ingredients which do not materially affect the basic and novel properties of the claimed invention. PPG Indus. V. Guardian Indus. Corp., 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998). The burden of showing that the basic and novel characteristics of the claimed composition would be materially effected is on appellants. In re De Lajarte, 337 F.2d 870, 874, 143 USPQ 256, 258 (CCPA 1964). In this case, no such showing has been made that the novel properties, i.e., improved binder properties or a reduction in emissions from the binder composition, would not be achieved by the addition of the Furness additional components. Accordingly, the additional components of Furness are not necessarily excluded by the term "consisting essentially of."

Finally, we note that in proceedings before the U.S. Patent and Trademark Office (PTO), unpatented claims must be interpreted by giving words their broadest reasonable meanings in their ordinary usage, taking into account the written description found in the specification. In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

Addressing Claim 12 more specifically, it requires the two-component binder system to consist essentially of: (a) a phenolic resin component which consists essentially of (i) a phenolic resin exhibiting free phenolic and free alcoholic OH groups, and (ii) a solvent for the phenolic resin; and (b) a polyisocyanate component consisting essentially of (i) a polyisocyanate capable of reacting with the phenolic resin component to form a resin, and (ii) a solvent which comprises a fatty acid methyl ester which is a methyl monoester of one or more fatty acids with a carbon chain of 12 or more carbon atoms.¹

The Furness Reference

Our review of Furness reveals that it discloses a phenolic resin component. Giving the claim terms their plain meaning, a phenolic resin is a synthetic thermosetting resin obtained by the condensation of phenol or substituted phenol with aldehydes.² In the instant specification, page 6, example 1, a phenolic resin precondensate is prepared by reacting phenol with paraformaldehyde.

We find that Furness suggests a phenolic condensation between a phenol and an aldehyde including paraformaldehyde (column 2, lines 44-47; column 3, line 65 - column 4, line 1), followed by a

¹ Claim 12 also recites that there is more fatty acid methyl ester than high boiling aromatic hydrocarbon. However, we note that no high-boiling aromatic hydrocarbon is required by the claim.

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reaction with a substance reactive with the phenolic OH groups (column 2, lines 48-55). The resinous composition is illustrated by a formula at column 1, lines 40 et seq., which contains alcoholic OH groups (i.e., when R^4 is hydrocarbon and $y=1$).

However, the appellants have vigorously argued, and we acknowledge, that Furness also discloses that the condensation products preferably contain substantially no free reactive phenolic groups, or less than about 5% (column 4, lines 47-53). In our view this is clear evidence that at least some reactive phenolic groups survive in the resin, and in a nonpreferred embodiment, they would be present.

A reference is available for all that it discloses and suggests, even unpreferred embodiments. See In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976); and In re Mills, 470 F.2d 649, 651, 176 USPQ 196, 198 (CCPA 1972). On balance, then, we find Furness teaches the presence of two reactive OH groups, which fulfills the condition of a two-component system laid out in the claim preamble.

Further, the appellants urge that Furness is a three-component system, in that it also has an additional phenolic component, which is not a resin (Appeal Brief, page 11, lines 1-30). We agree that Furness discloses an additional phenolic

² See Hawley's Condensed Chemical Dictionary, Fourteenth Edition, page 858, attached hereto.

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component which is a bisphenol, biphenol, thiodiphenol and the like (column 5, line 66 - column 9, line 41). However, the claimed two-component system does not exclude this component, as it reasonably appears that it functions within the context of the claimed two-component system (it has at least two reactive OH groups, although not a polyol).

A two component system can have different types of ingredients in it, yet still fulfill the principal definition of a two component system having one component (which can be a mixture of ingredients) with two OH groups, and another component (which may be a mixture of ingredients) containing the reactive isocyanate groups. The appellants have provided no evidence otherwise that the reaction is materially affected, nor have they restricted their claim to exclude this ingredient. We therefore find that the inclusion of the third phenolic ingredient of Furness is within the claim scope and conclude that it is not fatal to the case of obviousness.

We find that Furness further suggests suitable solvents for the phenolic and resinous components, which include a wide variety listed from lines 41-61 of column 9. The resinous component is mixed to homogeneity (column 9, lines 61-63).

We find that Furness also discloses organic polyisocyanates and suitable solvents, at column 10, lines 35-41. These solvents

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may be low-boiling hydrocarbons (column 9, lines 55-61).

Finally, as a mold release agent, we find that fatty acid esters such as methyl stearic acid ester are disclosed, in amounts preferably from 5-8 percent by weight (column 12, lines 18-20 and 46-53).

Thus, each claimed element reasonably appears to be present and capable of reacting to form a two-component polyurethane binder system. Furthermore, when a suggested low-boiling hydrocarbon is selected for the polyisocyanate, the restriction in the claim that there be more FAME than high-boiling hydrocarbon is fulfilled as well.

Discussion

Appellants initially argue that Furness discloses only high boiling aromatic hydrocarbon solvents for dissolving the polyisocyanate component of a three-component binder. (Appeal Brief, page 6, lines 6-12). This argument is not well taken.

The examiner has noted that Furness discloses acetone, ketones, monoester-monoethers of alkylene glycols, monochlorobenzene, aliphatic hydrocarbons, and low-boiling aromatic hydrocarbons (Examiner's Answer, page 3, lines 8-13).

This has not been challenged by the appellants. Our independent review of Furness reveals that the various types of

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solvents described by the examiner are suggested by Furness and found at column 9, lines 42-61.

Appellants particularly urge that the list of solvents must be read in one particular context, in that high boiling aromatic solvents must be used for the polyisocyanates, pointing to the specific examples as support therefore. (Appeal Brief, page 8, lines 17-23). We, however, differ in our reading of the Furness reference.

We find that Furness recites that the polyisocyanate can be employed in a solution of the solvents "hereinbefore described." (column 10, lines 35-37). The appellants would have us interpret this solution as reflecting the solution of the examples (Appeal Brief, page 7, lines 1, page 8, line 14). Alternatively, they urge that one of ordinary skill in the art would understand that the polar solvents in the list are for the polyisocyanate component, and the auxiliary solvents, being polar, must be for the polyisocyanate component.

We decline to be so restrictive in our reading of the reference. While solvent selection must be done to ensure proper solvation of the components, the solvents/auxiliary solvents are not assigned mandatory uses in Furness. Indeed, it appears to be left to the choice of the skilled artisan as to which solvents to select for which component. Finally, the two component binder

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system, when admixed, contains a homogeneous blend of all the components. Therefore, it matters not which component appellants assert is intended for which solvent, a mixture of all will meet the claim limitations.

Appellants also contend that Furness fails to disclose the use of a mold release agent as solvent, much less sole solvent, for both the phenolic resin and the polyisocyanate. (Appeal Brief, page 9, lines 13-24). We note that claim 12 is not restricted to the use of a mold release agent as a sole solvent. The claim language, to which our review is confined, only requires more fatty acid methyl ester than high boiling aromatic hydrocarbon in solvent (b) (ii). It does not require that fatty acid methyl ester be the majority of the solvent, or even that high boiling aromatic hydrocarbon be present.

Reading the claim as broadly as is reasonable, we agree with the examiner that, reading the suggested list of solvents supplied by Furness, when one of ordinary skill in the art selects a low-boiling hydrocarbon solvent for the polyisocyanate solvent of Furness, no (or minute amounts of) fatty acid methyl ester would be required. We consequently are not persuaded by this argument.

The appellants also urge that there is no teaching to select methyl monoesters of one or more fatty acids with a carbon chain of twelve or more carbon atoms from among the drying oils listed

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in Furness. (Appeal Brief, page 9, lines 25-30). This is simply incorrect. Furness states that typical esters are methyl stearic acid esters (column 12, lines 46-48). Stearic acid is a C₁₈ acid, which falls within the claim limitations.³

Further, appellants urge that the invention is in the reduction of high-boiling aromatic hydrocarbon solvent and Furness does not teach such. (Appeal Brief, page 10, lines 4-5). This position is not persuasive as the claim requires only that there be more fatty acid methyl ester than high-boiling aromatic hydrocarbon in the (b)(ii) solvent component. While this can in some ways be interpreted as a reduction (less than half of component (b)(ii) can be high-boiling hydrocarbons), Furness teaches a wide selection of potential solvents, some of which are low-boiling hydrocarbons.

We are cognizant of the appellants' counsel's arguments that the list of these solvents must be interpreted in a particularly narrow fashion. As discussed above, we find that, based upon the plain language of Furness, which terms them as solvents and auxiliary solvents without regard for proportion, that Furness allows for each component to be solvated therein in the suggested solvent mixtures as necessary.

³ See Hawley's Condensed Chemical Dictionary, 14th Edition, pages 1042-1043, attached hereto.

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The appellants also again state that Furness does not teach phenolic resins exhibiting free phenolic and free alcoholic OH groups. (Appeal Brief, page 10, lines 6-8). We disagree. As discussed above, Furness states in his resinous component structural formula in column 1 that alcoholic OH groups may be present, and in column 4 (although greatly reduced in a preferred embodiment), phenolic OH groups may be present. In Furness' less preferred embodiments, it is clear that more reactive OH groups may be present. While we agree with the appellants that the preference of Furness is to remove as many of the reactive groups as possible such that the phenolic composition can be the principal reactor in the two-component reaction, on balance we find that Furness discloses that those reactive groups may nonetheless be present.

We also note that claim 12 requires that the resin is "exhibiting" free phenolic and free alcoholic OH groups. The term "exhibiting" is undefined in the specification. The common definition of "exhibiting" is "to show or display outwardly" or "to have as a readily discernable quality or feature".⁴ No lower limit is set thereby. We find that, on balance on the facts of this case, Furness teaches the presence of alcoholic and phenolic OH groups, albeit preferably in a small percentage. Furness

⁴ Webster's New Collegiate Dictionary, page 401, copy attached.

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therefore suggests this claim limitation as well.

Next, the appellants urge that the claims are limited to a two-component binder system and that Furness does not teach a two-component binder system. (Appeal Brief, page 10, lines 15-31). While we agree that the claims are overall limited to a two-component binder system, we first note that the claims are directed to the final binder composition, and as such can be met by a prior art composition which suggests every element of the composition.

Furthermore, as discussed above, the claim is written in "consisting essentially of" language. To determine the components included versus excluded by this language, the claim must be read in light of the specification. In re Janakirama-Rao, 317 F.2d 951, 954, 137 USPQ 893, 896 (CCPA 1963); In re Herz, 537 F.2d 549, 551, 190 USPQ 461, 463 (CCPA 1976). In this regard, we emphasize that, from our perspective, it is an applicant's burden to establish that a component in a prior art composition is excluded from his claims by "consisting essentially of" language. See In re Herz, supra, 537 F.2d at 551-552, 190 USPQ at 463 ("[A]n applicant who has not clearly limited his claims is in a weak position to assert a narrow construction" and "[t]here is no evidence that . . . [the prior art] dispersant would materially affect the basic and novel characteristic of . . . [the claimed] composition"). Also see

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Ziegler v. Phillips Petroleum Co., 483 F.2d 858, 878, 177 USPQ 481, 494 (5th Cir. 1973) ("In the absence of any evidence that a third component [*7] was being excluded by the 'essentially consisting of' language, we cannot read those words as meaning 'consisting solely of' or 'consisting exclusively of'").

No evidence is presented that the additional phenol component of Furness would materially affect the two-component reaction between the phenol-containing resin of Furness and the polyisocyanate component of Furness. These components, which, when reacted together via the phenolic and alcoholic OH groups (or remaining OH groups in the preferred embodiment), are capable of producing a resin in a two-component binder system. Consequently, the appellants terming the Furness system as a "three-component" system, does not exclude the Furness system which is capable of functioning as a two-component system and therefore is not persuasive.

The appellants next urge that there is no teaching in Furness of the employment of more fatty acid methyl ester than other polyisocyanate solvent. (Appeal Brief, page 12, lines 7-20). While this also is technically true, the claim simply does not contain such a limitation. There is no lower limit of high-boiling solvent,⁵ and other suitable solvents could be employed from

⁵ For example, parent US Patent 6,136,888 contains claims which require the

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Furness' suggested list, regardless of whether they are deemed auxiliary solvents or not. Furness leaves the relative proportions up to the skilled artisan. Had the claims recited a particular concentration of fatty acid methyl ester, this argument and the previous arguments of the appellants would carry more weight.

Furness teaches the addition of fatty acid methyl ester containing a C₁₈ acid. Furness does this for a different purpose, but there is no evidence that the methyl stearic acid ester does not also act as a solvent for the polyisocyanate in the final mixture.

The appellants point to the fact that none of the examples contain the claimed fatty acid methyl ester. We note that a reference is not limited to the specific working examples. In re Chapman, 357 F.2d 418, 424, 148 USPQ 711, 716 (CCPA 1966).

Finally, the appellants urge that the solvent system selected must have compatibility with its components. We note that Furness teaches a homogeneous solution of the resin and the phenolic compound (column 9, lines 61-63) and that the polyisocyanate is employed in that solution (column 10, lines 35-41). Accordingly, we disagree and find that Furness contemplates "compatibility" in the solvents and components.

balance of the solvent (b)(ii) to contain a high boiling aromatic hydrocarbon.

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The appellants make additional arguments that Furness is not related to the problem of hazardous emission evolution. However, such a relation is unnecessary. Furness teaches the addition of the claimed compound in the claimed system for a different reason, mold release abilities. An obviousness rejection does not require a suggestion of the same problem that is being solved by appellant - all that is required is that the rejection provides a teaching, suggestion, or motivation to make the combination. See In re Dillon, 919 F.2d 688, 692-93, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990). Indeed, we find that such motivation is present in that the addition of the FAME will result in better mold release properties.

Appellants urge that a completely different polyurethane structure is formed (Appeal Brief, page 14, lines 14-20). This could be interpreted as an unexpected result and indicia of unobviousness. However, we are confined to the evidence of record, and the argument is devoid of citation to any place in the record where evidence of this purported difference may be found. Accordingly, this unsupported attorney argument is unconvincing.

The difficulty with the appellants' arguments is evidenced by the summary which they urge at page 15, in which they state that their invention provides a substitute for high boiling aromatic hydrocarbon solvents, which substitute must effectively dissolve

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the polyisocyanate component, have low viscosity and good viscosity reducing effect, not volatilize easily (remain present until firing), substitute for some or all of the high boiling aromatic solvent, not evolve toxic vapors on firing, and have good compatibility with the thick phenolic resin and the solvent for the phenolic resin. (Appeal Brief, page 15, lines 4-14). While these may all be desirable traits, these arguments are not directed specifically to a feature which is found in, or tied to, a specific claim limitation, and consequently are of little probative or persuasive value.

We acknowledge that these properties and goals may have value and be commercially successful, however, there simply is no nexus to claim 12 as written. It is the applicants' burden to precisely define the invention, not the PTO's. In re Morris, 127 F.3d 1048, 1056, 44 USPQ2d 1023, 1029 (Fed. Cir. 1997). In choosing to define the invention by the relative amounts of high-boiling aromatic hydrocarbons, the appellants have sacrificed much evidential clarity, especially while making arguments relating to the reduction in emissions from such hydrocarbons, which hydrocarbons are not technically required in the claims although a relative proportion are.

The appellants also state that "[p]roportions are not necessary to define this invention" (Appeal Brief, page 16, lines

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11-12) and that the point of the invention is reduction in the high boiling aromatic solvent (*Id.*, lines 13-15). Again, the appellants' arguments are misplaced. While proportions may not be necessary to define the invention, they are necessary to define over the cited prior art Furness, which suggests the instantly claimed composition. The reduction in the high boiling aromatic solvent is not directly claimed, as noted above. If a low-boiling hydrocarbon is selected in Furness to begin with, no such reduction is necessary.

Appellants further argue that the dependent claims further define over the independent claim as follows:

Claims 12, 20, 25, 26, and 28 - solvent (b)(ii) contains more FAME than high-boiling aromatic hydrocarbons. (Appeal Brief, page 17, lines 9-11). This argument is not persuasive as Furness's suggested solvents include a low-boiling aromatic solvent. When that solvent is selected, along with the suggested FAME for mold release, the claimed subject matter is suggested.

Claims 14 and 21 - solvents (a)(ii) and (b)(ii) consist essentially of FAME. (*Id.*, lines 12-13). As noted above, no showing has been made that the phenolic component of Furness is excluded by the language consisting essentially of. Consequently, this argument is unpersuasive as well.

Claims 15-16, 18, and 21 - solvent (b)(ii) consists

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essentially of FAME. (Id., lines 14-15). Again, no showing has been made that the phenolic component of Furness is excluded by the language consisting essentially of. We remain unpersuaded by this argument as well.

Claim 23 - solvent (a)(ii) and (b)(ii) are more FAME than high boiling aromatic hydrocarbons. (Id., lines 16-17). As noted above, Furness discloses other solvents, and therefore need not contain high boiling aromatic hydrocarbons. Accordingly, a minimal amount of FAME, such as the suggested 5-8%, will meet the claim limitation.

The appellants urge that the examiner has failed to consider the "consisting essentially of" limitations. However, we remind the appellants that it is their burden to establish what is excluded from this language by evidence that the excluded components materially affect the novel characteristics of the claimed invention, and no effort has been made by the appellants in this regard.

The appellants make numerous additional arguments attacking the examiner's positions from pages 19, line 23 - page 28, last line. These arguments illustrate the principal problem with the appellants' case; that no amounts of high-boiling aromatic hydrocarbon solvent, or other than trace amounts of FAME, are literally required by the claims. Appellants urge that myriad

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properties must be present and no interpretation of Furness can result in those properties. Again, most of the properties urged are either not recited in the claims, or not shown to be absent from Furness by evidence of record.

For sake of completeness, we address each of these contentions below seriatim.

Appellants' Point 3: The examiner's position is that the claims do not eliminate high boiling aromatic hydrocarbon. (Appeal Brief, page 18, lines 21 et seq.). The appellants have provided no citation to the record for this issue, and our review of the Examiner's Final rejection indicates that the statement appears at page 2, lines 10-11 in the context that there is no absolute requirement of high boiling aromatic solvent.

The appellants also argue that claim 24 concludes with the limitation that no high-boiling aromatic hydrocarbon is present. We agree, and note that the statement of the Examiner appears to be in error in that regard. However, we find that claim 24 still does not define over the suggested Furness non-high boiling solvent used.

Appellants' Point 4: A composition comprising 50% ester, 48% high boiling aromatic hydrocarbon, 1% resin, and 1% isocyanate is within the scope of the claims. We agree with the appellants that this statement is incorrect; however, again it is harmless

error.⁶

The Furness reference suggests several non-high boiling solvents and a mold release agent. When admixed, this composition would meet the limitations of the claims at issue - that there be a phenol resin component which is in a solvent, a polyisocyanate component in a solvent, and a FAME component which would be present in an amount of greater than the high-boiling aromatic hydrocarbon solvent. The phenol resin OH groups are capable of reacting with the polyisocyanate to form a two-component binder system.

Appellants' Point 6: The arguments involving aromatic solvents.

Appellants urge that their invention relates to the reduction of toxic fumes by reduction of high boiling aromatic hydrocarbons.

(Appeal Brief, page 22, lines 15-18). The problem with this argument is that neither the instant claims nor Furness require the presence of high-boiling aromatic hydrocarbons. The list of solvents includes low-boiling solvents which are not high boiling aromatic hydrocarbons. While we are aware of the

⁶ We also distance ourselves from the various statements of the examiner that compositions comprising 97% low boiling aromatic hydrocarbon, 1% ester, 1% resin, and 1% isocyanate would fall within the claim scope (Final Rejection, page 3, lines 1-9). Although we agree with the appellants that the examiner is incorrect in interpreting such dilute solutions as capable of being a binder, the disclosure of Furness stands by itself as discussed above. We therefore need not address Appellants' point 5, at the Appeal Brief, page 20-page 22) or points 7 and 8, Appeal Brief, pages 23-24, as we agree that the examiner is

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appellants counsel's arguments relating to the interpretation of the solvent list of Furness, we choose to rely upon the plain wording of Furness. We therefore are not persuaded by this argument.

Appellants' Point 9: The claims as requiring a two-component system.

We agree with the appellants that the claims require a two-component polyurethane system, a phenol and a polyisocyanate. However, this mistake by the examiner is harmless error, as both components are present in the Furness system, and as discussed above, the appellants have not shown how the additional constituents of Furness are excluded by the language "consisting essentially of."

Appellants' Point 10: Ethylbenzene Solvent in Example 14 (Appeal Brief, page 25).

Appellants urge that ethylbenzene may be used to modify the solubility characteristics of the polar solvents for the phenolic compound, and is not a low-boiling solvent for the polyisocyanate. Again, this argument relates to the interpretation of the solvent list which the appellants urge us to adopt. We read the list as more broadly inclusive than the appellants, and therefore are not persuaded by this argument.

incorrect in his conclusion, but find the error to be harmless.

Appellants' Point 11: Furness's Teaching of non-high boiling aromatic solvents.

The appellants urge that Furness teaches a three-component system with a high-boiling non-polar aromatic solvent for the polyisocyanate component, and urges that mold release agents are not solvents. The appellants also urge that the examiner has "trivialized" the invention and that it has been published in trade journals and a premium paid therefor. (Appeal Brief, page 26).

We note that this argument again addresses claim scope and interpretation of the Furness reference. We reiterate that the appellants have not shown the additional components of Furness to be excluded by the consisting essentially of language of claim 12. Further, as noted on pages 15-16 of this decision, the use of other suggested solvents in Furness accomplish this claimed result. Accordingly, we are unpersuaded by this argument.

The appellants are urging us to consider the evidence of secondary considerations, the commercial success and praise in respected trade journals, and the premium pricing of the commercial product. While we are impressed by the appellants' counsel's ardor in urging these results, we note that those results were initially urged in the prosecution of US 6,136,888 with successful results.

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The declaration submitted during prosecution of the instant application bears the serial number of that parent application to this one (08/742,945). Therefore, de facto and de jure those arguments relate to the claims as were pending then, not the instantly pending claims. It is, therefore, difficult to assess the impact of the trade journals and the commercial success of the cold box process on the patentability of the instant claims, which recite a relative proportion of FAME with a component which need not be present.

We note that secondary considerations are essential components of the obviousness determination. See In re Emert, 124 F.3d 1458, 1462, 44 USPQ2D 1149, 1153 (Fed. Cir. 1997) This objective evidence of nonobviousness includes copying, long felt but unsolved need, failure of others, see Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459, 467 (1966), commercial success, see In re Huang, 100 F.3d 135, 139-40, 40 USPQ2D 1685, 1689-90 (Fed. Cir. 1996), unexpected results created by the claimed invention, unexpected properties of the claimed invention, see In re Mayne, 104 F.3d 1339, 1342, 41 USPQ2D 1451, 1454 (Fed. Cir. 1997); In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2D 1934, 1936-37 (Fed. Cir. 1990), licenses showing industry respect for the invention, see Arkie Lures, Inc. v. Gene Larew Tackle, Inc., 119 F.3d 953, 957, 43 USPQ2D 1294, 1297 (Fed. Cir. 1997); Pentec, Inc. v. Graphic

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Controls Corp., 776 F.2d 309, 316, 227 USPQ 766, 771 (Fed. Cir. 1985), and skepticism of skilled artisans before the invention, see In re Dow Chem. Co., 837 F.2d 469, 473, 5 USPQ2D 1529, 1532 (Fed. Cir. 1988). The Board must consider all of the applicant's evidence. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444, ("An observation by the Board that the examiner made a prima facie case is not improper, as long as the ultimate determination of patentability is made on the entire record."); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984).

It does appear that there is some evidence that the appellants' cold-box process and "bio-resin" (Declaration, pages 7-10) results in some improved characteristics and has achieved a degree of commercial success. However, there is not an established nexus between the results and the claimed subject matter. The declaration states that this is due to activator 2E on page 7 of the specification, which contains only rapeseed oil methyl ester as a polyisocyanate solvent. In other words, there may be support for improved results when the polyisocyanate solvent consists of rapeseed oil, but not for the claims as instantly being prosecuted - wherein the polyisocyanate solvent is comprised of FAME wherein the fatty acid has a carbon chain of 12 or more carbon atoms and the FAME is present in a quantity greater than high-boiling aromatic hydrocarbon. Further, the appellants

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have not compared the other, non-high boiling solvents of Furness. See In re Simmons, 739 F.2d at 1575, 222 USPQ at 746 (" A nexus between the merits of the claimed invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision.").

Consequently, we find that, on balance, the praise, properties, and commercial results are insufficient to overcome the prima facie case of obviousness as they are not commensurate in scope with the claimed subject matter In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 778 (Fed. Cir. 1983); In re Clemens, 622 F.2d 1029, 1035, 206 USPQ 289, 296 (CCPA 1980) and do not compare the closest prior art.

Appellants' Point 12: The Sherwood Patent (Appeal Brief, page 27).

The appellants urge that the examiner erred in not considering the teachings of the Sherwood patent. While we agree that Sherwood is relevant in that it is "in line with the general idea that the preferred solvent for the polyisocyanate component is a high-boiling non-polar aromatic hydrocarbon" (Appeal Brief, page 8, lines 23 et seq.), this teaching still does not overcome the plain meaning of the teaching in Furness to use whatever solvents are suitable. We therefore are not persuaded by this

argument.

Appellants' Point 13: The Amount of Ester in Furness

The appellants urge that the ester in Furness is a mold release agent used in addition to and not in place of the solvent.

(Appeal Brief, page 27, line 20 et seq.). While this is true, the argument is not pertinent to the claim, which recites no particular lower level of FAME, as discussed before. The claim requires the FAME to act as a solvent, and there has been no showing that the amounts of FAME recited in Furness cannot act as a solvent. We therefore are not persuaded by this argument.

Appellants' Point 14: The Amount of Ester

Appellants urge that the claims require there to be more FAME than high-boiling aromatic hydrocarbon. (Appeal Brief, page 28, lines 15 et seq.). Again, this argument misses the point and misconstrues the claimed subject matter. The amount of ester disclosed in Furness is up to 10%. The claims read on this amount when a low boiling hydrocarbon solvent is utilized. The appellants also continue to urge a three-component/two component distinction when no showing has been made that the additional components of Furness are excluded by the language consisting essentially of, as has been discussed multiple times above.

Appellants' Point 15: The Declaration.

The appellants urge that they have compared the closest prior

art, that the closest prior art is not close, and they are entitled to extrapolate their data. (Appeal Brief, page 29, line 1 et seq.). We disagree. The appellants have erroneously concluded that Furness is not close; but a fair reading of the specification of Furness indicates that it is close to the claimed subject matter, principally by virtue of the manner in which the appellants have chosen to draft their claims. We have already discussed the lack of nexus and the fact that the evidence is not commensurate with the claimed subject matter above. We therefore are not persuaded by this argument.

Appellants' Point 16: The Declaration.

Appellants urge that even though the declaration related to both Furness and Gardikes, it is not irrelevant and the examiner should not disregard it. (Appeal Brief, page 29, line 29 et seq.). We agree, and have addressed the substance of the declaration above. It lacks nexus and is not commensurate in scope with the claimed subject matter. The appellants interpret the Furness reference much differently than it is actually written, and their claims much more narrowly than they are written. Accordingly, we are not persuaded by this argument.

Finally, the appellants argue that claims 26 and 27 are independently patentable in that the phenolic resin is prepared in

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the presence of zinc ions and zinc acetate, respectively.

We agree. The examiner has not established where these limitations are found within Furness. Our own scrutiny of the Furness reference has failed to discern these claimed requirements (zinc ions and zinc acetate).

Accordingly, as the examiner has failed to establish a prima facie case of obviousness vis-à-vis these two claims, we reverse this portion of the rejection as it applies to claims 26 and 27.

Summary of Decision

The rejection of claims 12-25 and 28-29 under 35 U.S.C. § 103(a) over Furness is sustained.

The rejection of claims 26-27 under 35 U.S.C. § 103(a) over Furness is reversed.

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No time period for taking any subsequent action in connection
with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED IN PART

TERRY J. OWENS)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
BEVERLY A. PAWLIKOWSKI)	
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
JAMES T. MOORE)	
Administrative Patent Judge)	

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